



Classroom Design Specialist

Performance Task

Introduction

A school district is re-designing one of their elementary schools. The school leaders are looking for ideas about how to re-design the classroom. Having comfortable furniture and spaces for students to work and learn is important. They also want this classroom to be an inviting space where students enjoy spending time. It will also be important to think about spaces for students to work together in groups.

Big Idea / Essential Questions

Big Idea

- Engineering design is a creative process that anyone can do which may result in new inventions and innovations.
- Geometric relationships can be described, analyzed, and classified based on spatial reasoning and/or visualization.
- Measurement attributes can be quantified, and estimated using customary and non-customary units of measure.

Essential Questions

- How is the engineering process and problem solving used when creating new inventions and innovations?
- How are spatial relationships, including shape and dimension, used to draw, construct, model, and represent real situations or solve problems?
- In what ways are the mathematical attributes of objects or processes measured, calculated and/or interpreted?

G.R.A.S.P.

Goal

Your goal is to design a new classroom for elementary students and their teacher. Your team will need to create a classroom environment that can help students learn in a comfortable space. You will need to think about the furniture and spacing needs. The school leadership wants the designs to be creative and ideas that would excite the students learning in the spaces.

Role

You are part of a team of classroom design specialists. Your teams works with schools and communities to create classrooms that are comfortable, exciting and inviting. Part of your job will include thinking about how you like to learn and what you wish your

classroom looked and felt like when you were in elementary school.

Audience

Your audience will be the school leaders and student council members. Your team will need to create a number of products that help explain your design ideas and persuade the audience that yours are the best.

Situation

Classrooms are the place where students spend the majority of their time while in school. Most students walk into the classroom and think little about what makes up the classroom. The physical space within a classroom is very important for student learning. When architects, teachers, and school leaders design classrooms they have to think about many different ideas. Your company has decided to enter a design competition to create a new classroom for an elementary school. The school leaders have encouraged teams in the competition to have fun with this project. You will need to think about your own experience in school and maybe also ask other elementary school students what they like or dislike about their classrooms. What classroom ideas would help kids learn best? What would make kids comfortable?

Products

1. Drawing

What does your designed classroom look like? How big is your classroom: What is the length and width? What is the perimeter and area of the space?

Through a drawing, create a picture of your classroom design for 25 students. Be sure to include the furniture, displays, color, lighting, and other parts of the classroom. It will be important for your audience to get a good idea of your design proposal through the picture they see.

- What are dimensions of a typical classroom?
- What furniture, displays, color, and lighting would be part of a classroom?
- How can a classroom be made comfortable for students?
- How can a classroom be designed to help students learn?

Drawing - Classroom Design Specialist

Achievement Levels	1	2	3	4
The Design Problem (x1)	Product shows little understanding of the problem and creates a design that minimally meets the needs and wants of teachers and students in the classroom.	Product shows partial understanding of the problem and creates a design that somewhat meets the needs and wants of teachers and students in the classroom.	Product shows sufficient understanding of the problem and creates a design that meets the needs and wants of teachers and students in the classroom.	Product shows strong understanding of the problem and creates a design that meets the needs and wants of teachers and students in the classroom.
Neatness (x1)	Product lacks neatness and legible labels.	Product is partially neat with somewhat legible labels.	Product is mostly neat with legible labels.	Product is neatly drawn with legible labels.
Labels (x1)	Product contains very few labels for elements of new classroom design.	Product contains labels for some elements of new classroom design.	Product contains labels for most elements of new classroom design.	Product contains labels that explain all included elements of new classroom design.

Achievement Levels	1	2	3	4
Measurements (x1)	Measurements shown are not realistic for a classroom.	Measurements are partially realistic for a classroom and the area and perimeter are attempted.	Measurements are realistic for a classroom and the area and perimeter are partially correct.	All measurements are realistic for a classroom and the area and perimeter are correctly calculated with units shown.

2. Furniture Plan

Create a diagram of the furniture plan for this new classroom that includes 25 student desks and other areas. This diagram can be done by hand or using a digital tool. In order to sell your plan, be creative with your design. What geometric shape(s) will your furniture be?

Students should calculate the area of furniture items including the space needed behind a desk to pull out a chair, if needed.

How much area of your classroom will be furniture. How much will be open space?

Draw a diagram that represents how the furniture will be arranged in this new classroom, including labels that explain dimensions of furniture or distances between items.

- What furniture do you need in a classroom?
- What are the dimensions of each piece of furniture?
- What is the total amount of space that each piece of furniture takes up? How will this affect the way you organize the furniture?

Furniture Plan - Classroom Design Specialist

Achievement Levels	1	2	3	4
Geometric Shapes (x1)	Few shapes are identified with the correct geometric name.	Some shapes are identified with the correct geometric name.	Most shapes are identified with the correct geometric name.	All shapes are identified with the correct geometric name.
Measurement (x1)	Student measures dimensions of classroom furniture with many errors in process or appropriate units.	Student measures dimensions of classroom furniture with some errors in process or appropriate units.	Student measures dimensions of classroom furniture with few errors in process or appropriate units.	Student measures dimensions of classroom furniture with no errors in process or appropriate units.
Area Calculations (x1)	Student calculates area of space needed for each piece of furniture (based on its dimensions) with little accuracy.	Student calculates area of space needed for each piece of furniture (based on its dimensions) with partial accuracy.	Student mostly accurately calculates area of space needed for each piece of furniture based on its dimensions.	Student accurately calculates area of space needed for each piece of furniture based on its dimensions.
Neatness (x1)	Product lacks neatness and legible labels.	Product is partially neat with somewhat legible labels.	Product is mostly neat with legible labels.	Product is neatly drawn with legible labels.
Labels (x1)	Product contains very few labels for furniture with corresponding dimensions included in the plan.	Product contains labels for some furniture with corresponding dimensions included in the plan.	Product contains labels for most furniture with corresponding dimensions included in the plan.	Product contains labels for all furniture with corresponding dimensions included in the plan.
Design Considerations (x1)	Product demonstrates minimal understanding of the needs and wants of teachers and students in the new classroom design.	Product demonstrates some understanding of the needs and wants of teacher and students in the new classroom design.	Product demonstrates adequate understanding of the needs and wants of teachers and students in the classroom design.	Product demonstrates strong understanding of the needs and wants of teachers and students in the classroom design.

Achievement Levels	1	2	3	4
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3. Proposal

Your team will need to write 1-2 page formal proposal that explains your design and the ideas behind it. This proposal will be given to the audience along with the drawing of your design.

Your proposal should begin with an introduction. Then, it should tell information about your design ideas such as: the furniture, learning spaces, displays, teacher space, color and anything else your team thought about. Be sure to explain why you made the choices you did and you may want to include research to support your decisions. Complete the written proposal with a formal conclusion that encourages the audience to select your proposal.

- What type of furniture will you use in your design?
- Where will there be space to display student work?
- How will your design help student learning and excite students?
- How will you create an environment that is good for students and the teacher?

Proposal - Classroom Design Specialist

Achievement Levels	1	2	3	4
Design Considerations (x1)	Product demonstrates minimal understanding of the needs and wants of teachers and students in the new classroom design.	Product demonstrates some understanding of the needs and wants of teacher and students in the new classroom design.	Product demonstrates adequate understanding of the needs and wants of teachers and students in the classroom design.	Product demonstrates strong understanding of the needs and wants of teachers and students in the classroom design.
Informative Writing (x1)	Product provides little detailed information about the proposed classroom design and reasons why all design choices were made.	Product provides some detailed information about the proposed classroom design and reasons why all design choices were made.	Product provides an adequate amount of detailed information about the proposed classroom design and reasons why all design choices were made.	Product provides a lot of detailed information about the proposed classroom design and reasons why all design choices were made.
Organization (x1)	Product is organized in a way that ideas do not flow logically from one to the next and it is difficult for the reader to understand.	Product is organized so that ideas flow somewhat logically from one to the next and can be somewhat understood by the reader.	Product is organized so that ideas flow mostly logically from one to the next and can be understood by the reader.	Product is organized so that ideas flow logically from one to the next and are easily understood by the reader.
Writing Mechanics (x1)	Product contains several errors in grammar and spelling mechanics.	Product contains some errors in grammar and spelling mechanics.	Product contains few errors in grammar and spelling mechanics.	Product is completed without errors in grammar or spelling mechanics.

4. Webcast â€” Persuasive/Informational

The school leadership has requested that all design submissions include a 1-2 minute web presentation. This presentation should inform the audience of your design proposal and the reasons why your team made these selections. This presentation should also persuade your audience that your design is the best and that students will benefit from learning in this classroom. Be sure to include visuals and perhaps multimedia to reinforce your web presentation.

- How can the classroom be made comfortable for students?
- How can the classroom be designed to help students learn?
- How does your design help students easily work together?

Webcast - Classroom Design Specialist

Achievement Levels	1	2	3	4
Design Considerations (x1)	Product demonstrates minimal understanding of the needs and wants of teachers and students in the new classroom design.	Product demonstrates some understanding of the needs and wants of teacher and students in the new classroom design.	Product demonstrates adequate understanding of the needs and wants of teachers and students in the classroom design.	Product demonstrates strong understanding of the needs and wants of teachers and students in the classroom design.
Content (x1)	Few parts of the webcast relate to the design proposal and reasons why design choices were made.	Some parts of the webcast relate to the design proposal and why design choices were made.	Most parts of the webcast relate to the design proposal and why design choices were made.	All parts of the webcast relate to the design proposal and reasons why design choices were made.
Organization (x1)	Product is organized in such a way that ideas do not flow logically from one to the next and it is difficult for the viewer to understand.	Product is organized so that ideas flow somewhat logically from one to the next and can be somewhat understood by the viewer.	Product is organized so that ideas flow mostly logically from one to the next and can be understood by the viewer.	Product is organized so that ideas flow logically from one to the next and are easily understood by the viewer.
Support Materials (x1)	Few visuals or audio materials in the webcast support or enhance the main ideas.	Some visual or audio materials included in the webcast strongly and enhance the main ideas presented.	Most visual or audio support materials included in the webcast strongly support and enhance the main ideas presented.	All visual or audio support materials included in the webcast strongly support and enhance the main ideas presented.

5. Journal

Each member of your team will need create a personal journal entry. This should be between 100 and 250 words. The purpose of this writing is to answer two questions: How do I like to learn in a classroom? What are some things that matter in a classroom and why? Your answers to these questions should be considered when you and your team begin the design of the new classroom.

- How do you like to learn in a classroom?
- What are some things that matter in a classroom and why?
- What are some things in a classroom that help to engage students in learning?

Journal - Classroom Design Specialist

Achievement Levels	1	2	3	4
Design Considerations (x1)	Product demonstrates minimal understanding of the needs and wants of teachers and students in the new classroom design.	Product demonstrates some understanding of the needs and wants of teacher and students in the new classroom design.	Product demonstrates adequate understanding of the needs and wants of teachers and students in the classroom design.	Product demonstrates strong understanding of the needs and wants of teachers and students in the classroom design.
Content (x1)	Journal entry addresses neither question posed in the description.	Journal entry addresses one question posed in the description.	Journal entry partially addresses both questions posed in the description.	Journal entry fully addresses both questions posed in the description.
Writing Mechanics (x1)	Journal entry contains several errors in grammar and spelling mechanics.	Journal entry contains some errors in grammar and spelling mechanics.	Journal entry contains few errors in grammar and spelling mechanics.	Journal entry is completed without errors in grammar or spelling mechanics.

6. Brochure: Room Size

The school leaders have asked your design team to create a brochure that showcases different dimensions of a different classroom they will need in the future. According to school policy, this classroom must have an area of 800 square feet. Show the ways to create a classroom with different lengths and widths that show a classroom with an area of 800 sq. ft. Be sure to include units. Also include a written explanation of which size(s) would be best for a classroom and why.

- What are the different ways to calculate 800 square feet?
- What will the lengths and widths of the classrooms be?
- Which ones are appropriate for a classroom and why?

Brochure - Classroom Design Specialist

Achievement Levels	1	2	3	4
Factors (x1)	Rooms show few correct factors of 800 as the length and width.	Rooms show some correct factors of 800 as the length and width.	Rooms show most correct factors of 800 as the length and width.	Rooms show all correct factors of 800 as the length and width.
Content & Units (x1)	Few parts of the brochure relate to the design proposal and are labeled with appropriate units.	Some parts of the brochure relate to the design proposal and are labeled with appropriate units.	Most parts of the brochure relate to the design proposal and are labeled with appropriate units.	All parts of the brochure relate to the design proposal and are clearly labeled with appropriate units.
Mathematical Explanation (x1)	The brochure has an inadequate explanation of why some sizes are appropriate for a classroom and others are not.	The brochure has some explanation of why some sizes are appropriate for a classroom and others are not.	The brochure has an adequate explanation of why some sizes are appropriate for a classroom and others are not.	The brochure has a thorough explanation of why some sizes are appropriate for a classroom and others are not.
Writing Mechanics (x1)	Product contains several errors in grammar and spelling mechanics.	Product contains some errors in grammar and spelling mechanics.	Product contains few errors in grammar and spelling mechanics.	Product is completed without errors in grammar or spelling mechanics.